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ABSTRACT

To help school districts with the task of assigning students to schools in order to achieve desegregation, the Illinois Institute of Technology has developed a system involving the use of planning techniques and computer technology that greatly simplifies the school district's job. The key features of the system are objectivity, minimum transportation impact, minimum transportation cost, proven application, availability, responsiveness, and economy. In implementing the plan, institute representatives meet with school district representatives and key school board members to determine the implementation schedule and to describe the school redistricting planning process; the district supplies basic information concerning the location of schools, the location of students, the ethnic group to which the student belongs, and certain policy information; the institute puts this information into a form that can be read by the computer and modifies the computer programs that will process the data; all information and programs are computer processed; the institute reviews outputs to determine compatibility with the school district requirements; and computer-generated plans are provided to the school district. (Author/IRT)

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COMPUTER ASSISTED ASSIGNMENT OF STUDENTS TO SCHOOLS TO ACHIEVE DESEGREGATION

EA 007 925

IIT RESEARCH INSTITUTE

INTRODUCTION

Many communities in the United States are faced with a dilemma. In these communities school children attend neighborhood schools.

Minority groups are not evenly distributed among the community's residential areas. Consequently, if children are assigned to the school located in their neighborhood the schools will tend to be segregated. The minority group children will be over represented in their neighborhood school and underrepresented in the other schools in the community.

Changes in residential living patterns will not take place at a sufficient pace to achieve the desired desegregation in a neighborhood schools system.

Therefore these communities will have to assign children to schools on a basis which differs from the traditional neighborhood school method in order to achieve desegregation of their school system. This can be a very difficult task for a school district.

To help school districts with this task IITRI has developed a system involving the use of planning techniques and computer technology which greatly simplifies the school district's job. The key features of this system are:

- Objectivity - The computer is completely objective (not prone to outside pressure) in redistributing students among schools to achieve desegregation.
- Minimum Transportation Impact - The plan developed maximizesthe number of students who walk.

- Minimum Transportation Cost - The plan keeps the total bussing distance to a minimum and consequently minimizes the transportation cost to the school district.
- Proven Application - It has been successfully used in several school districts.
- Availability - The system exists. It does not require a major development effort -- only minor modifications to adjust to a given school district.
- Responsiveness - In accomplishing its job the system produces results in a short period of time.
- Economy - For a modest fee all services from organizing the program to producing results can be provided by IITRI while relieving the school board and administration of a large administrative task.

This brochure describes in a straightforward manner how a school district may make use of this powerful tool.

PLANNING OVERVIEW

- IITRI meets with the school district and key school board members to determine the implementation schedule and to describe the school redistricting planning process.
- The school district supplies basic information concerning
  - -- the location of the schools
  - -- the location of the students
  - -- the ethnic group to which the student belongs
  - -- certain policy information

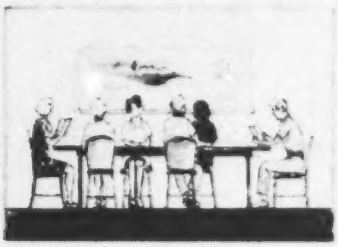
- IITRI puts this information into a form which can be read by the computer and modifies its computer programs which will process the data.
- All information and programs are computer processed.
- IITRI reviews outputs to determine compatibility with school district requirements.
- Computer generated plans are provided to the school district. These are used to effectively assign students to schools to achieve the desired level of desegregation.

PLANNING DETAILS

Policy Information

The school district meets with IITRI staff members and provides information concerning the school district's policies on class size, bussing, grade levels in each school, and desired desegregation levels.

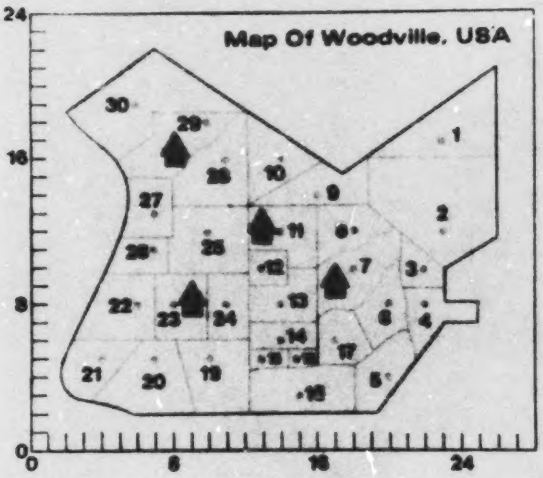
School District



Discusses Policies With IITRI

1. **High Grade**
2. **Low Grade**
3. **Class Size**
4. **Maximum Walking Distance**
5. **Desegregation Specifications**

Describing the School District



Locate Schools

The present school district boundaries are shown on a map of the area as shown above. A coordinate system is established with the origin in the lower left hand corner.

The area on the map within the school district boundaries is totally divided into residential areas.

It is important to note that each of these areas is ultimately assigned by the computer to a particular school. The students in these areas attend the school to which their residential area has been assigned.

Usually the task of establishing residential areas is accomplished with IITRI's assistance by one or two members of the school board or school administration who are knowledgeable with respect to the general distribution of the students residences within the school district. Each area should contain a reasonable number of students (usually not more than 30 or so). It is not necessary to count the number of students in each neighborhood to precisely determine their geographic distribution before the residential area boundaries are set.

The important thing is to draw the boundaries according to a school official's best judgment. If it develops that too many students have been included in a residential area, the first computer output will indicate this. Those areas with excessive numbers of students can be further subdivided and new residential areas established.

The approximate population center of each residential area is represented at the closest x and y coordinate intersection within the residential area. Each area is labelled with a number.

A list showing the x and y coordinates of each residential area is developed.

Residential Area List

Area No.	X	Y
1	23	17
2	23	12
3	22	10
4	22	8
...	...	...
30	6	19

Describing the Schools

Each school is located on the map in terms of its x and y coordinates.

On a special form supplied by IITRI, the following information is listed for each school.

School Code - a number assigned by the school district. The computer will recognize this number and identify it with this school.

Low Grade - the lowest grade in this building being considered in this assignment. (The school building may house different grade groupings, i.e., a junior high school and a senior high school but only one grade grouping is considered for assignment at one time).

High Grade - the highest grade in this assignment.

No. of Rooms - the number of rooms in the building assigned to the grades between the low grade and the high grade inclusive.

Capacity - the number of students which can be accommodated in these rooms. This is usually the number of rooms multiplied by the maximum class size specified for this grade grouping.

x & y Coordinates - the value of the x and y coordinate on the map which represents the school.

School List

No.	Name	Grade		Capacity	X	Y
		High	Low			
1	Washington	6	4	230	8	16
2	Jefferson	6	4	184	9	8
3	Lincoln	6	4	276	13	12
4	Wilson	6	4	230	17	9

Describing the Students

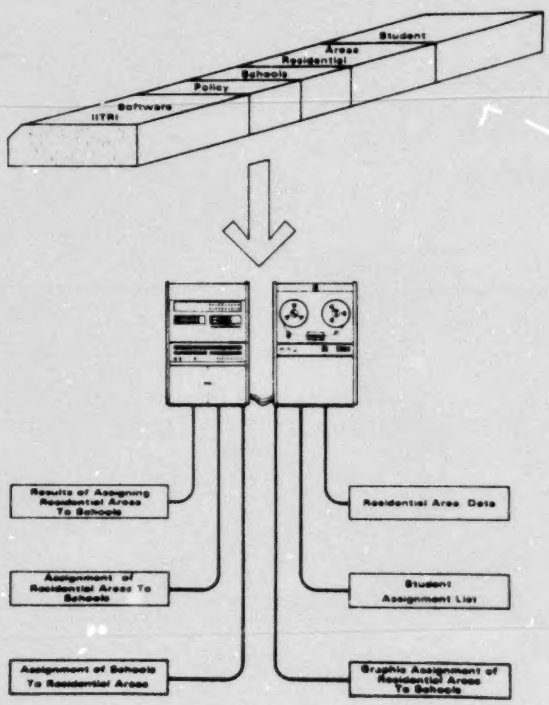
IITRI provides special forms on which each student's name together with his residential area, ethnic group, and school grade is listed.

Student List

Name	Residential Area	Grade	Ethnic Group
Jones, A	5	4	1
Smith, J	16	5	0
Rogers, T	2	4	0

Processing the Information

All information is received by IITRI and keypunched. The computer programs are modified and all information is computer processed to produce the system outputs.



The Computer Outputs

These can vary depending on the school district's particular requirements but the following typical outputs are always supplied:

- RESULTS OF ASSIGNING RESIDENTIAL AREAS TO SCHOOL

For each school, this output lists the number of Residential Areas assigned to the school, a breakdown by grade of the students, the percentage of students who will walk to school and the number of minority group students who will attend that school.

Results Of Assigning Residential Areas To Schools

School	No. of RA's	Students by Grade			% Walk	% Minority
		4	5	6		
1. Washington	6	62	61	80	83	18
2. Jefferson	7	59	65	42	90	22
3. Lincoln	9	85	88	81	75	21
4.Wilson	8	60	66	61	72	17
Totals	30	266	280	264	81	20

- ASSIGNMENT OF RESIDENTIAL AREAS TO SCHOOLS

For each school the number of the residential areas assigned to that school is listed.

Assignment Of Residential Areas To Schools

School	Residential Areas			
1.Washington	9	10	27	28
	29	30		
2.Jefferson	20	21	22	23
	24	25	26	
3.Lincoln	1	8	11	12
	13	14	15	18
	19			
4,Wilson	2	3	4	5
	6	7	16	17

- ASSIGNMENT OF SCHOOLS TO RESIDENTIAL AREAS

Each residential area is listed in sequence together with the school to which it is assigned, the number of students in the residential area, the distance (in eighths of a mile) between the residential area and the school, and the travel mode of the students in that residential area.

Assignment Of Schools To Residential Areas

Res. Area	School	No. Students	Distance	Travel Mode
1	3. Lincoln	19	15	Bus
2	4. Wilson	24	9	Walk
3	4. Wilson	21	6	Walk
4	4. Wilson	23	6	Walk
5	4. Wilson	24	8	Walk
6	4. Wilson	25	4	Walk
28	1. Washington	20	3	Walk
29	1. Washington	27	4	Walk
30	1. Washington	19	5	Walk

- RESIDENTIAL AREA DATA

For each residential area this document lists the breakdown by grade and for all grades the number of students by ethnic group (R1 and R0). The total number of students in the residential area is also listed.

Residential Area Data

Area	Grade								Total Students
	4		5		6		Total		
	RI	RO	RI	RO	RI	RO	RI	RO	
1	7	0	6	0	6	0	19	0	19
2	6	1	6	2	8	1	20	4	24
3	5	2	5	4	4	1	14	7	21
4	8	5	4	3	5	0	15	8	23
5	3	5	3	5	4	4	10	14	24
6	6	0	6	3	8	2	20	5	25
28	3	3	0	5	7	2	10	10	20
29	7	4	8	1	7	0	22	5	27
30	6	0	8	0	4	0	19	0	19

- THE STUDENT ASSIGNMENT LIST

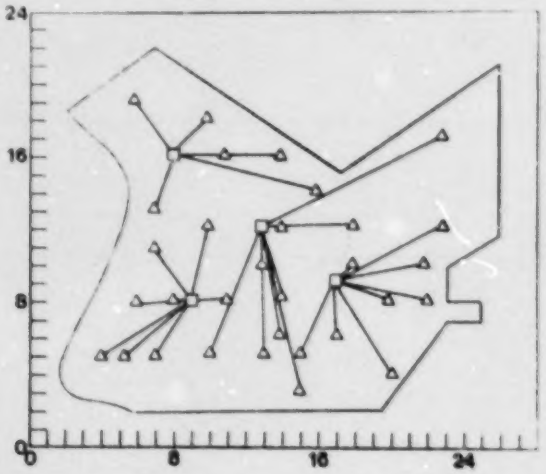
Each student in the district is alphabetically listed together with his residential area, school, grade, and ethnic group.

Student Assignment List

Name	Res. Area	School	Grade	Ethnic Group
Abbot, S.	3	4 Wilson	4	0
Armour, L.	27	1 Washington	4	1
Brown, J.	6	4 Wilson	6	1
Byrne, T.	6	4 Wilson	5	0
Caine, A.	18	3 Lincoln	5	1
Ciro, R.	26	2 Jefferson	4	0
Como, B.	22	2 Jefferson	5	0
Veranda, P.	14	3 Lincoln	5	1
Walsh, T.	9	1 Washington	6	1
Wilton, J.	30	1 Washington	6	1
Wyzsco, F.	20	2 Jefferson	6	0
Yule, J.	12	2 Jefferson	4	1
Zaccone, T.	17	4 Wilson	5	0

- GRAPHIC REPRESENTATION OF THE ASSIGNMENT OF RESIDENTIAL AREAS TO SCHOOLS

This picture is drawn by a computer. The triangles represent residential areas and the squares represent the schools. A line is drawn from each residential area to its assigned school. This picture can be superimposed on a school district map making it possible to visualize in one glance the way in which residential areas have been assigned to schools.



Graphic Representation Of Assignment Of Residential Areas To Schools

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Modifying the Data

After the outputs from the computer processing have been reviewed and verified by IITRI they are forwarded to the school district.

Both IITRI and the school district discuss the results. Based on these discussions certain changes and modifications can be made to resolve special problems. Among the changes that can be made are:

-- Pre-assigning certain residential areas to certain schools. This may result in more than the minimum transportation possible but it may be desirable for other reasons.

-- Changing some policies and obtaining a new assignment.

-- Making a finer breakdown of residential areas.

After these changes are made the data are reprocessed to produce a new assignment.

SUMMARY

A proven system has been described for planning school desegregation with a minimum of transportation. It provides for the effective application of school board policies, taking into account the detailed facts concerning the individual district. One facet of a very sensitive issue can thus be handled in a professional and objective manner at a modest cost.

IIT Research Institute is adequately prepared with an experienced staff who have successfully performed for other school districts to provide the following services:

- Conduct meetings with the School Board and Administration to thoroughly outline the program.
- Meet with community groups as desired to explain the program.
- Organize the project with the school district to discuss policy information and arrange for gathering and assembling the data.
- Verify and transcribe all data for computer processing.
- Modify computer programs and computer process all data.
- Review all computer outputs to insure conformance with program specifications.
- Review computer outputs with the school district and explain their content.
- Discuss possible modifications to the program and make the necessary changes to generate revised outputs.
- Assist the school district in presenting the final project outputs to appropriate groups in the community.

For more details and a discussion of your school district's special situation

Write or Telephone:

Manager of School Planning Software
IIT Research Institute
10 West 35th Street, Chicago, 60616

Telephone: Area Code 312/225-9630